

Red Wolf Recovery Program



Photo credit: Ryan Nordsven, USFWS

1st Quarter Report

October - December 2009

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www.fws.gov/redwolf



The Red Wolf Recovery Program

The red wolf (*Canis rufus*) is one of the most endangered canids in the world. Once occurring throughout the eastern and south-central United States, red wolves were decimated by predator-control programs and the loss and alteration of habitats. By the 1970s, these activities had reduced the red wolf population to a small area along the Gulf coast of Texas and Louisiana. To protect the species from extinction, the U.S. Fish and Wildlife Service initiated efforts to locate and capture as many red wolves as possible for the purposes of establishing a program to breed the species in captivity and one day reintroduce the species into a portion of its former range. More than 400 canids were captured in coastal areas of Texas and Louisiana, but only 17 were identified as red wolves. Fourteen of these wolves would become the founding members of the captive-breeding program and the ancestors of all red wolves existing today.

The first litter of red wolves born in captivity occurred in 1977. Within a few years red wolves were successfully reproducing in captivity, allowing the U.S. Fish and Wildlife Service to consider reintroducing the species in the wild. In 1987, four male-female pairs of red wolves were released in Alligator River National Wildlife Refuge (ARNWR) in northeastern North Carolina and designated as an experimental population. Since then, the experimental population has grown and the recovery area expanded to include four national wildlife refuges, a Department of Defense bombing range, state-owned lands, and private lands, encompassing about 1.7 million acres. However, interbreeding with the coyote (a species not native to North Carolina) has been recognized as a threat affecting the restoration of red wolves. Currently, adaptive management efforts are making progress in reducing the threat of coyotes to the red wolf population in northeastern North Carolina. Other threats, such as habitat fragmentation, disease, and premature mortality, are of concern in the restoration of red wolves. Efforts to reduce the threats are presently being explored.

Program Objectives

The current recovery plan (U.S. Fish and Wildlife Service, 1990) specifies the following objectives:

- 1) Establish and maintain at least three red wolf populations via restoration projects within the historic range of the red wolf. Each population should be numerically large enough to have the potential for allowing natural evolutionary processes to work within the species. This must be paralleled by the cooperation and assistance of at least 30 captive-breeding facilities in the United States.
- 2) Preserve 80% to 90% of red wolf genetic diversity for 150 years.
- 3) Remove threats of extinction by achieving a wild population of approximately 220 wolves and a captive population of approximately 330 wolves.
- 4) Maintain the red wolf into perpetuity through embryo banking and cryogenic preservation of sperm.

The Red Wolf Population

For the purposes of this report, all population figures are comprised only of known canids (i.e., wolves, coyotes, and/or hybrids that are actively monitored through either a functioning radio-collar or surgically implanted abdominal radio transmitter). Additional wolves, coyotes, and/or hybrids may be present, but have not been captured or their presence otherwise confirmed.

Population and Territory Status

A total of 69 red wolves occupied the Red Wolf Recovery Area (i.e., 1.7 million acres in five counties in northeastern North Carolina) at the end of the first quarter of our fiscal year 2010 (FY 10). The population includes 23 active pack territories (totaling 57 wolves) with 12 breeding pairs. An additional 12 wolves are not known to be associated with a pack (as defined in the Pack Summaries section). Compared to the end of the fourth quarter of FY 09, 68 wolves occupied the Red Wolf Recovery Area, representing 29 active pack territories with 10 breeding pairs.

Wolf Pairings

A breeding pair of wolves was formed during the quarter when staff biologists successfully removed a resident female coyote that was paired with a male wolf, allowing a young female wolf lingering near the territory to pair bond with the male.

Two breeding aged wolves, a male and a female, were captured in September 2009 and placed together in a soft-release acclimation pen in December 2009 in an attempt to form a new pair. Their release is planned for January 2010, pending the capture and removal of a pair of resident coyotes.

Wolf Captures and Radio Telemetry Marking

During this quarter, Red Wolf Recovery Program staff logged approximately 6,100 trap-nights. For that effort, 18 wolves were captured, 15 of which were fitted with radio-collars (either VHF or GPS). The three remaining wolves were young animals and their size precluded fitting them with a collar, thus they were surgically implanted with abdominal VHF radio transmitters. Captured wolves consisted of 10 males and 8 females; five adults (> 2 years of age), four yearlings (1-2 years of age), and nine pups (< 1 year of age).

Mortalities

Ten known wolves (4 males, 6 females) from the Red Wolf Recovery Area died during the quarter, including six attributed to gunshot, one the result of a collision with a vehicle, one the result of natural causes (old age), and two of unknown cause. Mortalities consisted of seven adult wolves (> 2 years of age) and two yearlings (1-2 years of age).

The first quarter corresponds with the rifle hunting season in eastern North Carolina. Gunshot mortality of wolves is typically higher during this quarter as compared to the rest of the year. Since 2005, the Red Wolf Recovery Program has annually recorded between four and six gunshot mortalities during the hunting season. Efforts to reduce gunshot mortalities through hunter education and outreach programs continue to be implemented.

Pack Summaries

For the purposes of this report, the criteria used to define a pack territory include a known wolf maintaining an established territory and is either associating with or has historically associated with another wild canid inhabiting the same territory. Packs identified in the following summaries include a minimum of one known wolf within the quarter being reported.

Milltail Pack (5 collared wolves)

The Milltail pack consists of the radio-collared adult breeding pair (1544M male, 1357F female) and three collared yearlings born in 2008 (1660F, 1661M, and 1662F). Three pups were born in 2009 but have not been captured and radio-collared. Adult pack member (1421M), a sibling to the breeding male (1544M), was found dead in December, but the cause of mortality could not be determined.

Gator Pack (1 collared wolf)

The only known member of the Gator pack is a radio-collared female (1085F).

Lux Pack (0 collared canids)

The radio-collared female (1541F) was killed by gunshot in December.

Hester Pack (1 collared wolf, 1 collared coyote)

The Hester pack consists of one radio-collared male wolf (1333M) and one radio-collared sterile female coyote.

Waupaupin Pack (2 collared wolves)

The Waupaupin pack consists of a radio-collared adult breeding pair (1657M, 1471F). Seven pups were born in 2009 to male 1313M and female 1471F, six of which have not been captured and collared. The remaining pup (1755M) was captured in November after having dispersed west to Pocosin Lakes National Wildlife Refuge (PLNWR). The pups' sire (1313M) was displaced in late summer 2009 by the current breeding male.

Ventures Pack (4 collared wolves)

The Ventures pack consists of the radio-collared adult breeding pair (1185M, 1207F) and two radio-collared yearlings born in 2008 (1705M and 1706F). Four pups were born in 2009 but have not been captured and radio-collared to date. A radio-collared yearling male (1703M) dispersed from this pack in November and became the new breeding male of the Rich pack.

Boundary Pack (0 collared canids)

The radio-collared adult female (1036F) was found dead in November from what appears to be natural causes related to old age. Staff biologists have lost contact with the radio collar of her mate (1439M), likely due to a dead battery. Wolf-sized tracks recently seen within the Boundary pack territory are thought to be his.

Swindell Pack (3 collared wolves)

The Swindell pack consists of the radio-collared adult breeding pair (1540M, 1419F) and one radio-collared yearling (1684M). Three pups were born in 2009, but have not been captured and radio-collared.

Weyerhaeuser Pack (1 collared wolf)

The only known member of the Weyerhaeuser pack is a radio-collared female (1440F).

ICW Pack (2 collared wolves, 2 wolves with abdominal transmitters)

The ICW pack consists of the radio-collared breeding female (1298F), one radio-collared yearling (1708F), and two pups (1780M, 1781M). The pups were captured and surgically implanted with abdominal radio transmitters in November. One additional pup born in 2009 has not been captured.

Kilkenny Pack (2 collared wolves)

The Kilkenny pack consists of a radio-collared breeding pair (1547M, 1170F). This is a new pair, formed in December, when the male was displaced from the Rich pack and in turn displaced Kilkenny's breeding male (1316M). Three pups were born to the previous breeding pair in 2009, and two zoo-born pups were fostered into the wild litter.

West Kilkenny Pack (0 collared canids)

The radio-collared female (1697F) was found dead in October. Her mortality appears to be the result of gunshot. A radio-collared, sterile male coyote was displaced from the territory by male wolf (1547M) shortly after the female wolf's death.

Rich Pack (4 collared wolves)

The Rich pack consists of a radio-collared breeding pair (1703M, 1633F) and two radio-collared pups (1741F, 1774M). The male appears to have recently displaced the pack's previous breeding male (1547M). Two pups were born to the previous breeding pair in 2009, and two zoo-born pups were fostered into the wild litter. The breeding pair and two of the pups were captured and radio-collared in December.

Pocosin Lakes Pack (2 collared wolves)

The Pocosin Lakes pack consists of a radio-collared breeding pair (1301M, 1358F). Four pups were born in 2009.

Beech Ridge Pack (3 collared wolves)

The Beech Ridge pack consists of radio-collared siblings, an adult female (1429F) and two yearlings (1693F, 1698M). The breeding male (1199M) was killed in December when struck by a vehicle. The breeding female (1162F) was killed in 2008 when apparently struck by a vehicle.

South Railroad Pack (0 collared canids)

The radio-collared female (1436F) was found dead in December. Her mortality appears to be the result of gunshot. A resident male coyote also was killed by gunshot in November.

Shirley Pack (1 collared wolf)

The Shirley pack consists of the radio-collared breeding male (1504M). His mate (1430F) died of unknown causes earlier in the year. Four pups were born in 2009.

Mannings Pack (1 collared wolf)

The Mannings pack consists of a radio-collared male (1469M). His mate (1668F) was found dead during the summer of 2009, but the cause of death could not be determined.

L-Block Pack (2 collared wolves)

The L-Block pack consists of a radio-collared breeding pair (1238M, 1539F). This pair was formed earlier in 2009 when biologists removed a sterile female coyote that had been paired with the male wolf. The female wolf was held in a soft-release acclimation pen within the territory; the two wolves pair bonded upon her release.

F2 Pack (1 collared wolf)

The only known radio-collared member of the F2 pack is a female (1577F).

Parker Tract Pack (1 collared coyote)

The radio-collared female wolf (1268F) was found dead in October. Her mortality appears to be the result of gunshot. A radio-collared sterile male coyote remains in the territory.

Scuppernong Pack (1 collared wolf, 1 collared coyote)

The Scuppernong pack consists of a radio-collared male wolf (1683M) and a sterile radio-collared female coyote. This pair bonded when the male dispersed from the Swindell pack earlier in 2009, and likely displaced the resident sterile male coyote.

Tyson Pack (8 collared wolves)

The Tyson pack consists of the radio-collared breeding pair (1519M, 1448F), three radio-collared yearlings (1678F, 1681M, 1682M), and three pups (1758F, 1760M, 1761M) that were captured and collared in late November. A fourth pup has not yet been captured. The breeding pair was captured and released in late December after their radio-collars were replaced.

Northern Pack (2 collared wolves)

The Northern pack consists of a radio-collared breeding pair (1628M, 1470F). This is a relatively new pack, formed when the male (1628M) dispersed from the Columbia pack earlier in 2009 and displaced the resident sterile male coyote.

Gumneck Pack (2 collared wolves)

The Gumneck pack consists of a radio-collared breeding pair (1516M, 1685F). This pack formed in December after biologists removed a female coyote that was paired with the male wolf. The female wolf (1685F) had dispersed from the Swindell pack earlier in 2009 and was in the Gumneck area prior to the coyote's removal.

Frying Pan Pack (4 collared wolves)

The Frying Pan pack consists of the radio-collared breeding male (1177M) and three of his radio-collared offspring, an adult male (1533M), a yearling female (1686F), and a female pup (1772F). The yearling and pup were captured, radio-collared, and released in December. The breeding female (1132F) was found dead earlier this year of unknown causes. Three additional pups were born in 2009. Two of the pups were killed when struck by a vehicle earlier in 2009; the status of the third is unknown.

Timberlake Pack (2 collared wolves)

The Timberlake pack consists of a radio-collared breeding pair (1452M and 1300F).

Columbia Pack (1 collared wolf, 1 collared coyote)

The Columbia pack consists of a radio-collared male (1458M), who was captured in October and fitted with a new collar, and a sterile radio-collared female coyote. The breeding female wolf (1163F) was found dead of an unknown cause earlier in 2009.

Highway 64 Pack (0 collared canids)

There are no known current members of the Highway 64 pack. The radio-collared breeding female (1665F) was killed by gunshot in November.

Collaborations

Research

The Red Wolf Recovery Program provided financial and in-kind support for collaborative research with scientists at other institutions, including universities, interagency divisions, and non-government research organizations. These investigations required project staff to assist outside researchers and graduate students in their efforts to better understand red wolf ecology, ecosystem function, and conservation efforts.

Project Title: Wild canid genetic sampling in Eastern North Carolina.

Graduate Student: Justin Bohling (PhD student)

Committee Chair/Principal Investigator: Lisette Waits, PhD, University of Idaho

Project Title: The effects of parenthood on red wolves (*Canis rufus*) in northeastern North Carolina.

Graduate Student: Justin Dellinger (MS student)

Committee Chair/Principal Investigator: Troy Best, PhD, Auburn University

Project Title: Identifying management procedures to reduce red wolf-coyote interactions in eastern North Carolina.

Graduate Student: Joseph Hinton (PhD student)

Committee Chair/Principal Investigator: Michael Chamberlain, PhD, Louisiana State University

Project Title: An assessment of spatial and temporal activities of wild adult male red wolves using GPS telemetry.

Graduate Student: Melissa Karlin (PhD student)

Committee Chair/Principal Investigator: John Chadwick, PhD, University of North Carolina at Charlotte

Project Title: Seasonal Cycles in Red Wolf Home Range Characteristics: A GPS Collar and Multispectral Satellite Image Study.

Graduate Student: Melissa Karlin (PhD student)

Committee Chair/Principal Investigator: John Chadwick, PhD, University of North Carolina at Charlotte

Project Title: Dietary overlap between red wolves (*Canis rufus*) and coyotes (*Canis latrans*) in Eastern North Carolina.

Graduate Student: Justin McVey (MS student)

Committee Chair/Principal Investigator: Chris Moorman, PhD, North Carolina State University

Project Title: Evaluating potential effects of widening US Highway 64 on red wolves, Washington, Tyrrell, and Dare Counties, North Carolina.

Graduate Student: Christine Proctor (PhD student)

Committee Chair/Principal Investigator: Michael R. Vaughan, PhD, Virginia Polytechnic Institute and State University (Virginia Tech)

Project Title: Genetic variability and evolutionary relationships of the red wolf.

Graduate Student: n/a

Committee Chair/Principal Investigator: Lisette Waits, PhD, University of Idaho

Publications

The following publications have gone to print in this quarter. A complete list of publications related to red wolves can be found at <http://www.fws.gov/redwolf/biblio.html>.

Beck, K.B., C.F. Lucash, and M.K. Stoskopf. 2009. Lack of impact of den interference on neonatal red wolves. *Southeastern Naturalist* 8(4):631-638.

Moresco, A., L. Munson, and I.A. Gardner. 2009. Naturally occurring and melengestrol acetate-associated reproductive tract lesions in zoo canids. *Veterinary Pathology* 46(6):1117-1128. [Abstract available at <http://www.ncbi.nlm.nih.gov/pubmed/19605907>]

Presentations

The following presentations related to red wolves were given during this quarter.

Bohling, J.H., A. Beyer, and L.P. Waits. 2009. Factors influencing red wolf-coyote hybridization in eastern North Carolina. Program and Book of Abstracts. Carnivores 2009, November 15-18, Denver, CO. [Abstract available at http://www.defenders.org/resources/publications/programs_and_policy/wildlife_conservation/impaired_species/wolf/carnivores_conference_2009.pdf]

- Karlin, M. 2009. An assessment of spatial and temporal behaviors of adult male red wolves using GPS collars. Program and Book of Abstracts. Carnivores 2009, November 15-18, Denver, CO. [Abstract available at http://www.defenders.org/resources/publications/programs_and_policy/wildlife_conservation/impe_riled_species/wolf/carnivores_conference_2009.pdf]
- Kroeger, T. 2009. Economic benefits provided by red wolf habitat in North Carolina. Program and Book of Abstracts. Carnivores 2009, November 15-18, Denver, CO. [Abstract available at http://www.defenders.org/resources/publications/programs_and_policy/wildlife_conservation/impe_riled_species/wolf/carnivores_conference_2009.pdf]
- Mahoney, P., T.D. Steury, and D.L. Murray. 2009. A re-assessment of red wolf viability using stage-structured, stochastic models. Program and Book of Abstracts. Carnivores 2009, November 15-18, Denver, CO. [Abstract available at http://www.defenders.org/resources/publications/programs_and_policy/wildlife_conservation/impe_riled_species/wolf/carnivores_conference_2009.pdf]
- Steury, T., K. Beck, A.B. Beyer, and D.L. Murray. 2009. Can large carnivores persist in human-dominated landscapes? The case of the red wolf. Program and Book of Abstracts. Carnivores 2009, November 15-18, Denver, CO. [Abstract available at http://www.defenders.org/resources/publications/programs_and_policy/wildlife_conservation/impe_riled_species/wolf/carnivores_conference_2009.pdf]
- Waits, L. 2009. Molecular genetic contributions to noninvasive survey approaches for carnivores. Program and Book of Abstracts. Carnivores 2009, November 15-18, Denver, CO. [Abstract available at http://www.defenders.org/resources/publications/programs_and_policy/wildlife_conservation/impe_riled_species/wolf/carnivores_conference_2009.pdf]
- Wheeler, K. 2009. The face of red wolf conservation today. Program and Book of Abstracts. Carnivores 2009, November 15-18, Denver, CO. [Abstract available at http://www.defenders.org/resources/publications/programs_and_policy/wildlife_conservation/impe_riled_species/wolf/carnivores_conference_2009.pdf]

Staff and Volunteers

The Red Wolf Recovery Program employs eight full-time staff, including the program coordinator, four wildlife biologists, a biological technician, an outreach coordinator, and an administrative assistant. During the quarter being reported the outreach coordinator and administrative assistant positions were vacated. The Red Wolf Recovery Program also employs an intern.

Outreach

Staff from the Red Wolf Recovery Program conducted numerous presentations and attended several events to inform and educate the public on the conservation needs of the red wolf and the restoration efforts of the Red Wolf Recovery Program. As part of our effort to assist educators, red wolf “discovery boxes” were distributed to 21 educational facilities in Florida, New York, North Carolina, Tennessee, Texas, and Virginia. Discovery boxes include materials about the red wolf and are used to support red wolf education.

The Red Wolf Recovery Program also seeks to achieve a quality visitor and participant experience in the U.S. Fish and Wildlife Service's priority recreational uses on National Wildlife Refuges. Our outreach efforts focus on four of the six program elements, including wildlife observation, wildlife photography,

environmental education, and interpretation, and are conducted frequently in partnership with ARNWR and PLNWR educators and volunteers.

Presentations

Date	Location	Audience	Length	Attendance	Presenter
Nov 13	ARNWR	Duke University & Society for Conservation Biology (Triangle Chap.)	3 hours	20	M. Morse

Howlings

Date	Location	Event	Length	Attend	Presenter
Oct 17	ARNWR	Wolf Awareness Week	2 hrs	45	D. Hendry K. Wheeler
Oct 24	ARNWR	Howl-O-Ween	2 hrs	Rain Out	D. Hendry K. Wheeler
Nov 5	ARNWR	Wings Over Water	2 hrs	20	D. Hendry K. Wheeler
Dec 12	ARNWR	Holiday Howl	2 hrs	43	D. Hendry K. Wheeler

Partnerships

Species Survival Plan (SSP)

Species Survival Plan (SSP) captive facility coordination is based at Point Defiance Zoo & Aquarium (PDZA) in Tacoma, Washington. The SSP currently coordinates 42 captive red wolf sites at zoos and nature centers housing about 120 wolves. The following information is based on activities completed or conducted by the SSP Coordinator during the quarter reported. Additional information on the SSP can be found at www.fws.gov/redwolf or www.pdza.org.

The SSP Coordinator reported completing and distributing the final breeding and transfer recommendations for the captive population, and directly communicating with cooperators to ensure that transfers and recommendations were accomplished. The SSP Coordinator also reported that den locations were identified and additional land clearing had been conducted at the Northwest Trek site. The Northwest Trek will replace the existing Graham facility as the flagship captive-breeding facility at PDZA. The development of Northwest Trek was made possible, in part, from funds from the Omnibus Appropriations Act 2009 (Public Law 111-8 – March 11, 2009), and the efforts of Congressman Norm Dicks (WA) and Congressman Heath Shuler (NC). An additional \$179,000 was awarded to the Western North Carolina Nature Center (Asheville, NC) to upgrade their red wolf breeding and holding facilities.

Island Propagation Sites

The U.S. Fish and Wildlife Service utilizes island sites to propagate red wolves and contribute to the restoration of a wild red wolf population, primarily by fostering island-born wolves into the wild population as a means to augment the wild red wolf gene pool with “under-represented” genes from the captive population. Currently, the Red Wolf Recovery Program cooperates with St. Vincent National Wildlife Refuge in maintaining a breeding pair of red wolves on an island site.